

I claim:

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1. An improved desktop operated computer control device of the type having a rotatable ball for pointing control, said control device further of the type including  
5 a housing, electronic circuitry within said housing and coupled to communication means for communicating control signals from said electronic circuitry to a computer, a plurality of finger depressible buttons exposed on said housing and interfacing with sensors electrically  
10 connected with said electronic circuitry for allowing user selection of control signals communicated to a computer; at least two of said sensors each capable of providing at least three readable states of varied conductance, at least two states of said at least three readable states  
15 dependant upon depressive pressure applied to the variable-conductance sensors through depression of an associated button;

wherein the improvement comprises:

said electronic circuitry including means for reading  
20 said at least three readable states and for producing a distinct control signal for each state of said at least two states.

2. An improved desktop operated computer control device according to claim 1 wherein the distinct control  
25 signals are screen scrolling control signals, and are used to determine scrolling speed rates.

3. An improved desktop operated computer control device of the type having a rotatable ball for pointing control, said control device further of the type including  
30 a housing, electronic circuitry within said housing and coupled to communication means for communicating control signals from said electronic circuitry to a computer, a plurality of finger depressible buttons exposed on said housing and interfacing with sensors electrically

connected with said electronic circuitry for allowing user selection of control signals communicated to a computer;

wherein the improvements comprise:

at least two of said sensors including pressure-sensitive variable-conductance material to provide at least three readable states of varied conductance, said states dependant upon depressive pressure applied to the pressure-sensitive variable-conductance material;

said electronic circuitry including means for reading said at least three readable states and for producing a distinct control signal for each of at least two states of said at least three readable states.

4. An improved desktop operated computer control device according to claim 3 wherein the distinct control signals are screen scrolling control signals, and are used to determine scrolling speed rates.

5. An improved desktop operated computer control device of the type having a rotatable ball for pointing control on a computer monitor, said control device further of the type including a housing, electrical power source means for powering electronic circuitry, said electronic circuitry located within said housing, said electronic circuitry coupled to communication means for communicating control signals from said electronic circuitry to a computer, a plurality of finger depressible buttons exposed on said housing and interfacing with sensors electrically connected with said electronic circuitry for allowing user selection of control signals communicated to a computer;

wherein the improvements comprise:

at least two of said sensors each structured to provide at least three readable states of varied conductance, said states dependant upon depressive pressure applied individually to the sensors of said at

least two sensors;

said electronic circuitry including means for reading said at least three readable states and for producing scroll control signals representative of each of at least  
5 two states of said at least three readable states;

a first sensor of said at least two sensors, said first sensor associated with a first button of said finger depressible buttons, said first button variably depressible to allow applying varied depressive pressure  
10 to said first sensor, said first sensor connected to said electronic circuitry, said electronic circuitry for reading said at least three readable states and producing at least two different scroll-up values as said scroll control signals;

15 a second sensor of said at least two sensors, said second sensor associated with a second button of said finger depressible buttons, said second button variably depressible to allow applying varied depressive pressure to said second sensor, said second sensor connected to  
20 said electronic circuitry, said electronic circuitry for reading said at least three readable states and producing at least two different scroll-down values as said scroll control signals.

6. An improved desktop operated computer control  
25 device in accordance with claim 5 wherein the first and second sensors are each elastomeric dome-cap sensors each including a pressure-sensitive variable-conductance material positioned over proximal conductive circuit elements of said electronic circuitry.

30 7. An improved desktop operated computer control device in accordance with claim 5 wherein the first and second sensors are each packaged sensors each comprising:  
a package housing;  
an electrically conductive concavo-convex resilient

disk within the package housing;

two normally electrically separated proximal circuit elements at least in-part within the package housing;

a depressible button retained to the package housing  
5 and positioned such that depression of the button depresses said disk;

pressure-sensitive variable-conductance material positioned within the package housing to receive compressive pressure thereagainst from and upon depression  
10 of said disk, said pressure-sensitive variable-conductance material further positioned to define at least a portion of an electrically conductive path defined between said proximal circuit elements upon depression of said disk, whereby said electrically conductive path is of varied  
15 electrical conductivity dependant upon an amount of compression applied to said pressure-sensitive variable-conductance material.

8. An improved computer control mouse of the type including a housing, electrical power source means for  
20 powering electronic circuitry, said electronic circuitry located within said housing, pointer control means coupled to said electronic circuitry for allowing user control of a pointer on a computer monitor, said electronic circuitry coupled to communication means for communicating output  
25 control signals from said electronic circuitry to a computer, a plurality of finger depressible buttons exposed on said housing and interfacing with sensors electrically connected with said electronic circuitry for allowing user selection of output control signals  
30 communicated to a computer;

wherein the improvements comprise:

at least one of said sensors structured as a pressure-sensitive variable-conductance sensor for varying conductance through multiple readable states, said states  
35 dependant upon depressive pressure applied to a finger

depressible button associated with said at least one of said sensors; and

said electronic circuitry structured for reading said multiple readable states, and for communicating to a

5 computer

a first output control signal type, and

a second output control signal type,

communication of either one of the first and second output control signal types determined by an amount of

10 time of depression of said button, and said second output control signal type further communicating data representing a depressive level of depressive pressure applied to said button.

9. An improved computer control mouse according to  
15 claim 8 wherein said first signal type is a previous address Back signal type, whereby a user is allowed to press and release said button and have activated the command to return along a most recently followed link.

10. An improved computer control mouse according to  
20 claim 9 wherein said second signal type is a variable rate screen-scroll signal type, whereby a user is allowed to press and continuously hold said button to achieve a scrolling of data on a computer monitor screen.

11. An improved computer control mouse according to  
25 claim 9 wherein said second signal type is a activate menu of Back addresses signal type, whereby the user is allowed to press and continuously hold said button to achieve display of a selectable list of previously visited addresses.

12. An improved method of controlling window  
scrolling of a computer using a desktop operated computer control device of the type having a rotatable ball for

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pointing control, the control device further of the type including a housing, electrical power source means for powering electronic circuitry, said electronic circuitry located within said housing, said electronic circuitry coupled to communication means for communicating control signals from said electronic circuitry to a computer, a plurality of finger depressible buttons exposed on said housing and interfacing with sensors electrically connected with said electronic circuitry for allowing user selection of control signals communicated to a computer; said control device further of the type wherein a user depresses a scroll control button of said buttons to activate a scroll control signal related to the depressed button, and releases the depressed button to deactivate said scroll control signal;

wherein the improvement comprises:

depressing, by the user, said scroll control button with any user selectable pressure level of a plurality of user selectable pressure levels, the user selectable pressure levels associated with various distinct values of said scroll control signal, whereby the user controls screen scrolling rate by way of selecting the pressure applied to said scroll control button.

13. An improved method of controlling window scrolling of a computer using a desktop operated computer control device according to claim 12 wherein the method further comprises

increasing pressure applied to said scroll control button for increasing scrolling rate.

14. An improved method of controlling window scrolling of a computer using a desktop operated computer control device according to claim 12 wherein the method further comprises

decreasing pressure applied to said scroll control

button for decreasing scrolling rate.

15. A method of manufacturing an improved desktop  
operated computer control device of the type having a  
rotatable ball for pointing control including the known  
prior art steps of: molding a housing; installing means  
for receiving a power source; installing electronic  
circuitry within said housing and connected to said means  
for receiving said power source; connecting communication  
means to said electronic circuitry for communicating from  
said control device to a computer; installing a rotatable  
ball; connecting to said electronic circuitry means for  
sensing rotation of said ball for pointing control;  
installing a plurality of finger depressible buttons  
positioned for bearing on sensors electrically connected  
with said electronic circuitry; said electronic circuitry  
for reading a plurality of said sensors as sensors having  
only two readable values; and  
further including the novel combined steps of:  
installing pressure-sensitive variable-conductance  
sensors positioned to be activated by depression of at  
least some buttons of said finger depressible buttons,  
said variable-conductance sensors structured to provide at  
least three readable values, said values dependant upon  
depressive pressure applied to said pressure-sensitive  
variable-conductance sensors;  
installing circuitry for reading an immediate value  
of said at least three readable values of the pressure-  
sensitive variable-conductance sensors, and for  
communicating data representative of the immediate value  
from said control device to a computer,  
whereby said improved device is manufactured for  
communicating data representative of the depressive  
pressure applied to said pressure-sensitive variable-  
conductance sensors.

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